# The Venezuelan Species of Pimpla (Hymenoptera: Ichneumonidae) 

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Abstract.-The Venezuelan species of Pimpla (Hymenoptera: Ichneumonidae: Pimplinae) are reviewed. Four new species are described and illustrated: P. lasallei, P. mitchelli, P. vangeli and P. vayonae. An identification key to 18 species is given, including the previously described species: P. albomarginata Cameron, P. azteca Cresson, P. bolivari Porter, P. caeruleus Cresson, P. croceipes Cresson, P. croceiventris (Cresson), P. flavipennis Enderlein, P. ichntumoniformis Cresson, P. platysma Porter, P. punicipes Cresson, P. pyramis Porter, P. sanguinipes Cresson, P. sumichrasti Cresson and P. tomyris Schrottky. Pimpla croceipes, P. croceiventris, P. ichneumoniformis, P. pyramis and P. tomyris are recorded for the first time in Venezuela.

Pimpla is a large genus represented in almost all regions of the world, although it does not seem to be present in Australia and New Zealand (Gauld 1984, Gupta 1987). The species of Pimpla are idiobiont parasitoids of lepidopterous pupae and prepupae. Terán (1980) recorded the following host associations from Venezuela: P. azteca from a pupa of Alabama argillacea (Noctuidae); P. platysma from a pupa of Antichloris eriphia (Syntomidae); P. punicipes from A. argillacea, Oiketicus sp. and Platoeceticus sp. (Psychidae), and Phobetron hipparchia (Eucleidae); P. sumichrasti from a pupa of Hypsipylla grandella (Pyralidae).

Townes and Townes (1966) recorded 29 species as occurring in the Neotropics, but only $P$. albomarginata, $P$. punicipes and $P$. sanguinipes were cited from Venezuela. Porter (1970) conducted the first taxonomic study of the South America members of the genus. He treated 35 species, of which 21 were described as new. Only P. bolivari was described as new from Venezuela and $P$. caeruleus was recorded for the first time in this country. Gauld (1991) treated 17 Costa Rican species of which 8 are present in Venezuela. These last two works must be seen for a detailed review of the infor-
mation available on biology, etology and host preferences.

## MATERIALS AND METHODS

Species treated in this study were identified using the keys of Porter (1970) and Gauld (1991) or through comparison with material examined in The Natural History Museum (British Museum) in 1996. Approximately 800 specimens of Pimpla were examined. The following institutions provided specimens for this study:
BMNH: The Natural History Museum, London, U.K.
MIZA: Museo del Instituto de Zoología Agrícola, Facultad de Agronomía, Universidad Central de Venezuela, Maracay, Venezuela.
UCOB: Museo Dr. J. M. Osorio, Departamento de Ciencias Biológicas, Agronomía, Universidad Centrooccidental Lisandro Alvarado, Tarabana, Lara, Venezuela.
The nomenclatural treatment, morphological terminology and taxonomic characters used here follow the work of Gauld (1991). Microsculpture terminology follows that of Eady (1968).

## KEY TO VENEZUELAN SPECIES OF PIMPLA

1. Metasoma with laterotergite V broad, more than 0.5 times as broad as long (Fig. 1); malar space wide, as long as or longer than basal mandibular width, that of male more than 0.7 times basal mandibular width2

- Metasoma with laterotergite V narrow, less than 0.3 times as broad as long (Fig. 2); malar space narrow, less than 0.75 times as long as basal mandibular width, that of male less than 0.6 times basal mandibular width (in P. flavipennis is more than 1.0 times basal mandibular width) ..... 3

2. Laterotergites II and III more than 0.5 times as broad as long, of similar width to later- otergites IV and V (Fig. 1); female with posterolateral corner of mesopleuron usually finely punctate; male hind tibia with central white band punicipes Cresson

- Laterotergites II and III less than 0.3 times as broad as long, clearly narrower than later-otergites IV and V (Fig. 2); female with posteroventral corner of mesopleuron striated;male hind tibia reddishsanguinipes Cresson

3. Forewing with Rs strongly sinuous (Fig. 3); tergite I of female rather slender, in profile evenly convex ..... 4

- Forewing with Rs more or less straight (Fig. 4); tergite I of female short and broad, in profile generally strongly convex ..... 10

4. Head and mesosoma predominantly yellow or orange, sometimes with black marks, fore- wing with an apical black spot ..... 5

- Head and mesosoma predominantly black or blackish brown; forewing without apical black spot ..... 7

5. Mesoscutum entirely yellow or orange ..... 6

- Mesoscutum yellow with three longitudinal black stripes; female with tergites VI and VII of metasoma almost entirely black sumichrasti Cresson

6. Metasoma predominantly orange, at most with only extreme anterior margins of tergitesI-IV black; propodeum smooth and polished . . . . . . . . . . . . . . . . . . . . . . . . azteca Cresson

- Metasoma predominantly yellow; female with tergites VI and VII of metasoma whollyblack; propodeum with several strong transverse wrinklesmitchelli sp.n

7. Metasoma black with extensive yellow marks ..... 8

- Metasoma black without yellow marks, sometimes apical margins of tergites with a brownish tinge ..... 9

8. Ovipositor very strongly flattened beyond basal 0.5 ; mesopleuron without wrinkles in posteroventral corner platysma Porter

- Ovipositor stouter and not strongly flattened; posteroventral corner of mesopleuron withsome wrinklingtomyris Schrottky

9. Antenna brownish; forewing yellowish with entire anterior margin strongly infumate;basal 0.5 of tergite I closely and coarsely punctate . . . . . . . . . . . ichneumoniformis Cresson

- Antenna black; forewing uniformly yellow; tergite I almost wholly smoothflavipennis Enderlein

10. Apex of clypeus deeply bilobed (Fig. 5); forewing with cu-a slightly distal to the base ofRs \& M11

- Apex of clypeus slightly concave; fore wing with cu-a opposite to the base of Rs \& M ..... 16

11. Mesoscutum entirely black; propodeum without conspicuous posterolateral tubercles ..... 12- Mesoscutum black with white marks; propodeum with conspicuous posterolateral tuber-cles14
12. Tergite 1 in profile with high, more or less sharply pyramidal hump; all coxae black;- Tergite I in profile with moderately high blunt hump; coxae without black markings;mesopleural suture weakly foveolate1313. Sternite I with strongly produced swelling, postscutellum black; fore coxa white; meta-soma black and white banded


Figs. 1-5. Pimpla. 1-2, Metasoma, lateral view, showing laterotergites (lt): 1, P. punicipes; 2, P. sumichrasti. 34, Fore wing: 3, P. sumichrasti; 4, P. lasallei. 5, P. lasallei. Clypeus, anterior view.

- Ventral swelling on sternite I rather low and rounded; postscutellum pale yellow; forecoxa pale yellow; metasoma black and white with reddish-brown tinge that becomes stronger on tergites VI and VII
bolivari Porter

14. Ovipositor stout; tergites VI and VII reddish with apical margins yellowish; sternite I yellowish-brown
lasallei sp.n

- Ovipositor thin and short; tergites VI and VII black and white banded or uniformly reddish; sternite I black

15. Tergite I short, almost as long as apical width; propleuron with two white marks; hind tibia black with premedial white band . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . vayonae sp.n

- Tergite I 1.5 times as long as apical width; propleuron wholly black; hind tibia reddish, its extreme base black and premedial band yellow .......................... . vangeli sp.n

16. Body metallic blue, wings blackish; male with forecoxa white marked anteriorly

- Body not metallic, head and mesosoma black, wings hyaline

17. Metasoma and hind coxa uniformly black; hind tibia bright yellow . . . . croccipes Cresson

- Metasoma and hind coxa reddish; hind tibia orange . . . . . . . . . . . . croceiventris (Cresson)


## Pimpla mitchelli Díaz, new species

Holotype female.-Forewing length 13.5 mm . Head in dorsal view moderately short, with genae rounded behind eyes; frons strongly concave; posterior ocellus separated from eye by diameter of ocellus. Mandibles moderately long, strongly and evenly tapered, with upper tooth approx-
imately 1.6 times the length of lower tooth; clypeus in profile weakly convex basally, apically flat; clypeus in anterior view 2.5 times as wide as medially long, with apical margin very slightly concave; malar space 0.4 times as long as basal mandibular width; lower face centrally weakly convex, smooth and shining, with
few irregularly dispersed punctures under the antennal sockets. Mesoscutum polished, with fine punctures separated by about $1.0 \times$ their diameter; weakly convex; scutellum polished with few dispersed fine punctures separated by about $1.5 \times$ their diameter. Mesopleuron highly polished, with few and sparse puctures separated by about $3.0 \times$ their diameter, posterodorsally smooth; epicnemial carina reaching above level of centre of pronotum; metapleuron convex, smooth and polished, with punctures only along its upper margin; submetapleural carina strongly raised in anterior part, evanescent in posterior 0.4 of metapleuron. Propodeum in profile rounded; pleural carina absent; anterior 0.5 of the dorsal surface with several strong transverse wrinkles, posterior 0.5 smooth. Forewing with distal abscissa of Rs strongly sinuous; cu-a distal to base of Rs \& M by 0.2 times its own length; discosubmarginal cell densely setose; abscissa of Cul between $1 \mathrm{~m}-\mathrm{cu}$ and Cu1a as long as Cu1b. Tergite I of metasoma short and stout, almost as long as apical width, smooth; tergite I in lateral view with dorsal surface weakly convex; sternite I not clearly swollen centrally; tergite II highly polished, with disperse punctures in anterior part, punctures separated by about $1.5 \times$ their diameter, posterior part smooth, anterolaterally with well-defined oblique grooves; tergites IIIV similar, but with oblique grooves progressively weaker on succeeding segments; laterotergites II-V narrow and inconspicuous, less than 0.2 times as broad as long. Ovipositor sheath 0.8 times as long as hind tibia; apex of ovipositor subcylindrical, with upper valve smooth and lower valve with 7 ridges that do not extend laterally. Color: Predominantely orange. Mandibular teeth, small D-shaped spot between posterior ocellus and eye, small triangular spot under median ocellus, scape and pedicel dorsally, flagellum, scuto-scutellar sulcus, tergite VI, and most of tergite VII, black. Posterior half of tar-
somere I of foreleg, tarsomeres 3-5 of middle leg, hind tarsus except basitarsomere, apical half of hind tibiae, two rounded spots in the middle of tergite I, anterior margin of tergite II-V and posterior margin of tergites I-V, dark brown to blackish. Wings with slight yellow tinge and with distinct subapical blackish spot. Pterostigma yellow.

Etymology.-This species is dedicated to Pam Mitchell for her generosity and her contribution to the study of Neotropical Icheneumonidae.

Remarks.-P. mitchelli belongs to the sumichrasti species-group. It differs from $P$. sumichrasti in having the mesoscutum, mesopleuron, propodeum, and mid and hind coxae orange. It differs from P. azteca and the Central American species $P$. personni in the coloration of the metasoma. The only specimen at hand was collected with a net. Nothing is known about its biology.

Material examined.-Holotype ㅇ, Venezuela, Bolívar State, Caicara- San Juan de Manapiare road, km 210, 30. m, iv-1976 (Gélvez \& Salcedo) (MIZA).

## Pimpla lasallei Diaz, new species

Holotype female.-Forewing length 12 mm . Head in dorsal view moderately short, with genae reduced behind eyes; frons strongly concave; posterior ocellus separated from eye by 0.6 times diameter of ocellus. Mandible of moderate length, strongly and evenly tapered, with upper tooth 1.5 times length of lower; clypeus basally moderately convex, apically flattened; clypeus in anterior view 1.7 times as broad as medially long, apically bilobate; malar space 0.8 times as long as basal mandibular width; lower face centrally weakly convex, shallowly and closely punctate, punctures separated by about $0.5 \times$ their diameter. Mesoscutum slightly polished, shallowly punctate, punctures separated by about $0.5 \times$ their diameter; scutellum convex, smooth. Mesopleuron slightly polished, with punctures separated by about $1.0 \times$ their diameter, epicne-
mial carina reaching above level of centre of pronotum; metapleuron moderately convex, coarsely striate; submetapleural carina complete, anteriorly raised. Propodeum in profile moderately declivous, posterolateral tubercles slightly pointed; pleural carina incomplete; dorsal surface of propodeum centrally strongly striate, striae crossing tubercles, anteriorly weakly striated, posteriorly smooth and polished. Forewing with distal abscissa of Rs straight; cu-a distal to base of Rs\&M by less than 0.2 times length of cu-a; discosubmarginal cell with glabrous area along veins Rs\&M, Cu 1 and 1 m -cu; abscissa of Cu 1 between $1 \mathrm{~m}-\mathrm{cu}$ and Cu 1 a 1.8 times as long as Culb. Tergite I of metasoma moderately long, 1.7 times as long as apical width; tergite I in lateral view slightly convex, lateral carina distinct on spiracle. Sternite I moderately long, weakly swollen just behind its centre; tergite II smooth, with few irregularly sparse and shallow punctures, anterolaterally with deep oblique grooves. Tergites III-V similar, anterolateral grooves becoming progressively weaker; laterotergites III-V narrow and inconspicuous, 0.2 times as broad as long. Ovipositor sheath 0.6 times as long as hind tibia; apex of ovipositor depressed, the lower valve not laterally expanded. Color: Predominantly black. Clypeus brown-reddish. The following whitishyellow: scape ventrally, palpi, upper and anterior margins of pronotum, propleuron, lateral margin of mesoscutum, narrow stripes along position of notauli that reach scutoscutellar sulcus, scutellum, small crescentic spot on postscutellum, upper margin of tegula, subalar prominence, two elongate spots on epicnemiun, antero-dorsal area of mesepisternum, circular spot on the lower-posterior part of mesepisternum, mesepimeron, dropshaped spot on the upper area of metapleuron, propodeal tubercles, and posterior margin of tergites. Fore and middle legs yellowish, excepting for orange of dorsal area of femora. Hind coxa brown
with irregular D-shaped whitish spot on proximal end dorsally, trochanter and trochantellus yellow, femur brown, tibia with proximal end brown, its basal half yellowish and its apical half brown, tarsomeres orange, progressively darker. Wings with slight yellowish tinge. Pterostigma yelloworange.

Male.-Similar to female but with fore wing length 8.3 mm ; malar space 0.6 times as long as basal mandibular width; discosubmarginal cell with glabrous area only below pterostigma; color as female except that metapleuron and mesoscutum in front of tegulae without white spots.

Etymology.-This species in named in honor of John LaSalle for his studies on Neotropical Eulophidae and his spirit of friendly collaboration.

Remarks.-P. lasallei belongs to the albomarginata group. It is easily recognized by its large size, the strongly produced ventral swelling on sternite 1 , and its color pattern.

Biological notes.-P. lasallei has only been found in Venezuela. Two specimens were taken with a net in a typical rain forest. No host records are available for this species.

Material examined.-Holotype $\circ$, Venezuela, Lara State, Yacambú National Park, La Pastora, 1600 m, III - 1981 (F. A. Díaz \& C. Pereira) (UCOB). Paratype. Venezuela: Lara State, Yacambú National Park, 1 $M$, same data as holotype (UCOB).

## Pimpla vayonae Diaz, new species

Holotype female.-Forewing length 7.3 mm . Head in dorsal view short, with genae constricted behind eyes; frons strongly concave. Posterior ocellus separated from eye by about 0.6 diameter of ocellus. Mandibles moderately long, evenly tapered, with upper tooth about 2.0 times length of lower; clypeus in anterior view 2.0 times as broad as medially long, apically strongly bilobate; malar space 0.8 times as long as basal mandibular width; lower face centrally weakly convex, with shallow
punctures separated by about $0.7 \times$ their diameter. Mesoscutum shining with punctures separated by about $0.7 \times$ their diameter; scutellum convex, smooth. Mesopleuron highly polished, ventrally with close punctures separated by about $1.5 \times$ their diameter, dorsoposteriorly smooth; epicnemial carina reaching above level of centre of pronotum. Metapleuron moderately convex, dorsally with some striae and coarse punctures separated by about $1 \times$ their diameter, ventrally with sparse fine punctures separated by about $2 \times$ their diameter; submetapleural carina complete, raised anteriorly. Propodeum in profile weakly declivous, with strong and blunt tubercles posterolaterally; pleural carina only present anteriorly; dorsal surface of propodeum anteriorly transversely weakly wrinkled, area between tubercles smooth and shining. Forewing with abscissa of Rs straight; cu-a distal to base of Rs\&M by 0.3 times its own length; discosubmarginal cell moderately setose, with setae more sparse toward margin of Rs\&M; abscissa of Cu 1 between $1 \mathrm{~m}-\mathrm{Cu}$ and Cu1a 1.6 times as long as Cu1b. Tergite I very short and stout, almost as long as apical width; tergite I in lateral view convex; sternite I short, strongly swollen just before its centre, with swelling directed forward. Tergite II microaciculate and shining, anterolaterally with deep oblique impressions; tergites III-V similar, with anterolateral furrows becoming progressively weaker. Laterotergites II-V narrow and inconspicuous, 0.2 times as broad as long. Ovipositor short and thin; ovipositor sheath 0.4 times as long as hind tibia; apex of ovipositor cylindrical. Color: Predominantly black. The following white: Ventral face of scape, palpi, upper and anterior margins of pronotum, two oval marks on propleurum, two triangular marks on anterior margin of mesoscutum which run backward along notauli, scutellum, postscutellum, tegula, subalar prominence, anterodorsal area of mesepisternum, circular spot located just above middle coxa, me-
soepimeron, propodeal tubercles, posterior half of propodeum except area petiolaris, hind margin of all tergites. Foreleg with coxa except extreme base, trochanter, inner face of trochantellus, stripe along inner face of femur, apex of outer face of femur, and inner and outer faces of tibia white. Remainder of trochantellus, femur, and tibia, orange. Tarsus orange, tarsomere V darker. Middle leg with coxa white, except for orange dorsal face; trochanter, trochantellus, and femur orange; tibia with its basal 0.2 and apical 0.3 dark brown, its central part white; tarsus dark brown, tarsomere V blackish. Hind leg with coxa reddish, its dorso-anterior face with circular white mark; trochanter, trochantellus and femur, red; tibia black with a premedial white ring. Tarsus black. Wings hyaline. Pterostigma black with base and apex whitish.

Male.-Unknown
Etymology.-This species is named in honor of Venezuela Carrizo Ayona for her generosity and spirit of collaboration.

Remarks.- $P$. vayonae belongs to the albomarginata species complex, and is related to $P$. vangeli and the Mesoamerican $P$. edgari Gauld. All three species have the ovipositor short and thin. P. vayonae differs from $P$. vangeli and $P$. edgari in the coloration of propleurum, mesopleurum and hind legs, and in having tergite I almost quadrate and the propodeum weakly striated.

Biological notes.- $P$. vayonae has only been found in Venezuela. The specimen was collected in a Malaise trap situated in a coffee-Macadamia area. Nothing is known about its biology.

Material examined.-Holotype F. Venezuela: Lara state: Villanueva, Finca "Las Lomas", 900m. III-1994 (F.A.Díaz) (UCOB).

Pimpla vangeli Díaz, new species
Holotype Female.-Forewing length 9.39.6 mm . Head in dorsal view short, with genae constricted behind eyes; frons strongly concave; posterior ocellus sepa-
rated from eye by $0.4-0.6$ times diameter of ocellus. Mandibles of moderate length, strongly and evenly tapered, with upper tooth 1.5-1.6 times length of lower; clypeus in profile moderately convex, apically flattened; clypeus in anterior view 1.6-1.7 times as broad as medially long, apically bilobate; malar space 0.7-1.0 times as long as basal mandibular width; lower face centrally weakly convex, with shallow punctures separated by $0.7 \times$ their diameter. Mesoscutum slightly polished, with shallow punctures separated by about $0.5 \times$ their diameter; scutellum convex, smooth. Mesopleuron weakly polished, evenly, finely and closely punctate, the punctures separated by $0.5 \times$ their diameter; epicnemial carina reaching above level of centre of pronotum. Metapleuron convex, coarsely striate; submetapleural carina distinct, complete, anteriorly sharply raised. Propodeum in profile slightly inclivous, pleural carina present only anteriorly; dorsal surface of propodeum anteriorly transversely wrinkled, posteriorly with pair of strong and blunt turbercles, area between turbercles smooth and shining. Fore wing with distal abscissa of Rs almost straight; cu-a distal to the base of Rs\&M by 0.3 times length of cu-a; discosubmarginal cell evenly and densely setose; abscissa of Cu 1 between $1 \mathrm{~m}-\mathrm{Cu}$ and Cu1a 1.7-1.8 times as long as Cu1b. Tergite I of metasoma moderately short and stout, 1.5 times as long as apical width; tergite I in lateral view strongly convex; lateral carina present only posteriorly. Sternite I moderately long, strongly swollen just before its centre, apex of swollen area directed anteriorly. Tergite II microaciculate, weakly polished, anterolaterally with oblique grooves. Tergites III-V similar; laterotergites II-V narrow and inconspicuous, less than 0.2 times as broad as long. Ovipositor very short and thin; its sheath 0.4 times as long as hind tibia; apex of ovipositor depressed. Color: Predominantly black with clypeus and mandibles brown, palpi yellowish, apex of scape yel-
low-brownish. The following white: Dorsal and anterior margins of pronotum, anterolateral margin of mesoscutum, narrow stripe along notauli, tegula, scutellum, subalar prominence, mesopleuron, propodeal tubercles, posterior half of propodeum and hind margin of tergites I-IV. Posterior half of tergite V and tergites VI and VII reddish. Foreleg with coxa white, its inner basal extreme blackish; trochanter whitish; trochantellum whitish except for orange inner face; femur, tibiae, and tarsus orange. Middle leg with coxa yellowish, its outer face orange, basal and apical extremes infuscated, rest of middle leg orange excepting for lighter premedial area of tibia. Hind leg with coxa reddish, its outer face with D-shaped whitish mark and its apex black; femur reddish with apex black; tibia reddish with its basal 0.1 black, and premedial area yellow, its outer face darker than inner face; tarsi dark brown. Wings weakly and evenly infuscated. Pterostigma blackish.

Male.-Similar to female but with fore wing length 8.1 mm , malar space 0.7 times as long as basal mandibular width, propodeal wrinkles weaker, tergite I longer and tergites II-VII with abundant setiferous punctures.

Etymology.-This species is named in honor of Angel Luis Viloria (University of Zulia, Venezuela), for his dedication to the study of Satyridae (Lepidoptera) and for his unique concept of friendship and solidarity.

Remarks.- $P$. vangeli belongs to the albomarginata species complex. It can be easily distinguished by its short and thin ovipositor, the color of metasoma and hind legs and the wings evenly infuscated. Three specimens collected with a net are at hand. No details of the biology of this species are known.

Material examined.-Holotype O. Venezuela: Lara state: Rio Claro,1200 m, v-1973 (J. M. Osorio and R. González) (UCOB). Paratypes: Venezuela. 1 female, Lara state, Sanare, 1350m, VII-1993 (A. J. Escalona) (BMNH). 1M, Lara state, 8 km SE Sanare,

La Capilla, 1800 m, II-1993 (F. A. Díaz)
(UCOB). (UCOB).

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